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their eggs. The ova are pale yellow, ellipsoidal in shape, measuring 2.5 x 3 mm.—*Nature*, August 26, 1897.

Zoological Articles in Recent Journals.—In Vol. 105 of the *Sitzungsberichte* of the Vienna Academy, Dr. Franz Werner writes upon the Scaling of the Reproduced Tail in Lizards; Dr. F. Steindacher upon some Zoological Results of the Expedition of the "Pola" to the northern part of the Red Sea; Dr. P. Knold upon the Blood Corpuscles of Vertebrates; and Dr. H. Albrecht upon the Comparative Anatomy of the Mammalian Larynx.

PSYCHOLOGY.¹

Odor-mixture.—The relation of elementary sensations to the sensation of their compound has given rise to much theoretical discussion. In the senses of sight and hearing it has also been the subject of considerable experimental work. The laws of color-mixture have long since been formulated, and the sequence of the color series, like that of the tone series, is well known. In the domain of smell, owing to practical difficulties that attend the investigation, little progress has been made. Certain odors stand marked as qualitatively distinct, but their relations to one another and the arrangement of their "shades" into a single graduated series has never yet been satisfactorily demonstrated. On the other hand, it has been shown that odor-mixtures (of many odors, at least) give rise to new and qualitatively simple odors, thus resembling the color-mixtures rather than the accords of tone combinations. Zwaardemaker, in a recent work, gives a series of nine distinct classes of odors, into one or other of which he thinks any particular odor can be placed. He resolves compound odors into elements belonging to two or more of these classes. When the organ of smell is fatigued for one class of odors, the remaining elements in the compound are sensed, and if the compound consists of but two elements they may readily be distinguished by this means. Both this author and Aronsohn, an earlier writer, speak of certain odors which do not combine to form a mixture, but when placed together give rise to a *blended* sensation, each element of which may be sensed separately at will. In some compounds, again, one element predominates so strongly that the other is wholly indistinguishable.

¹ Edited by Howard C. Warren, Princeton University, Princeton, N. J.

Nagel has lately taken up the investigation² by a different method—that of simply sensing the various compounds without fatiguing the organ of smell. As a result of his investigations he concludes that odor-mixtures without exception follow the law of color-mixture. When one element of a compound extinguishes the other it is because the former is of far greater intensity; but by reducing this intensity sufficiently a combination is at length reached in which the two unite to form a true mixture. He therefore takes exception to the earlier view, and believes that any two odors can be mixed in such proportions as to produce, at least momentarily, the sensation of a simple odor, of a quality distinct from the components. Whether the new odor is sensed as such permanently, or not, depends on the condition of the sense-organ; if the latter is less fatigued for some of the elements than for others, the former will gradually tend to predominate. The true color-mixture—that in which none of the elements predominate—“resembles each of its components, without, however, being like them.” Thus the principles of odor-mixing, according to Dr. Nagel, are similar to those of color-mixing; and the correspondence extends, as far as the author’s observation goes, to the law of intensity; the intensity of an odor-mixture is never stronger than that of its components. The author has found several pairs of odors that are more or less complementary and produce an almost odorless mixture, though he has never succeeded in reaching this limit. As regards the arrangement of simple odors into a series, Dr. Nagel’s experiments do not tend to verify the classifications hitherto proposed; but he does not venture upon a classification of his own, since he has been unable to discover any odors which can be regarded as really “elementary.”—H. C. W.

Psychology at the British Association.—At the Toronto meeting of the British Association, last August, a cordial invitation was given to psychologists to participate. There being no Psychological Section in the Association, the department was assigned to Section I (Physiology), and Dr. Kirschmann, of Toronto, was appointed a secretary of that Section to represent the interests of psychology in the arrangement of the program.

Among the papers of special psychological bearing presented in the Section were the following: On visual reaction to intermittent stimulation, by Dr. Grünbaum, of Cambridge, England; on the nature and physical basis of pain, by Prof. L. Witmer; on the physiology of instinct, by Prof. Lloyd Morgan; and two on various problems of

² *Zeitsch. f. Psychologie*, 1897, XV, p. 82.

animal psychology, by Prof. Wesley Mills. Physiological psychology was well represented on the program. Prof. H. P. Bowditch discussed the rhythmic action of smooth muscles, and Prof. Carl Huber, of Michigan, reported experiments on the innervation of motor tissues with special reference to nerve endings in the sensory muscle spindles; Prof. F. S. Lee, of Columbia, read a paper on the ear and lateral line in fishes, in which he discussed the bearing of the semi-circular canals on the sense of equilibrium; and Prof. W. P. Lombard, of Michigan, discussed the effect of frequent excitations on the contractility of muscle. One session was devoted to the demonstration of physiological and psychological apparatus. Prof. Lombard exhibited a new and inexpensive type of chronograph. Prof. Scripture demonstrated the use of the Pendulum Chronoscope as a means for measuring small periods of time, and exhibited a "tricolor lantern" for illustrating the laws and effects of color combination. Prof. C. S. Sherrington performed some experiments in visual contrast and upon the flicker phenomenon; and Dr. J. H. Kellog exhibited a new dynamometer, especially adapted for clinical use. A combined meeting of the physiological and botanical Sections was held for the discussion of the chemistry and structure of the cell; Profs. Meldola, J. R. Green, and Macallum contributed papers at this session.

In addition to the foregoing, a number of papers having a distinctly psychological bearing were presented in Sections H (Anthropology) and D (Zoology). At one session of Section H several papers on Indian customs and folk-lore were contributed by Miss Fletcher and Messrs. Hill-Tout, R. N. Wilson and Hagar. At another session of the same Section reports were presented on the subject of anthropometric measurements in the schools, and the treatment of dull and slightly abnormal children. A paper by Dr. Franz Boas was read, embodying a statistical examination of the growth of Toronto school children; Prof. Witmer reported the results of some comparative tests—both mental and physical—between white men, white women and Indian men. The Presidential Address of Section H, by Sir. W. Turner, was an examination of some of the distinguishing characteristics of human structure.

In the zoological Section the subject of variation and selection received some attention. Prof. C. S. Minot spoke on the origin of vertebrata, and Prof. H. F. Osborn on the origin of mammalia. Prof. E. B. Poulton discussed the value of mimicry as evidence of the truth of Natural Selection; Mr. W. Garstang, of Plymouth, England, spoke on Recapitulation, and Prof. Lloyd Morgan on the natural history of

instinct. Two papers bearing on the genetic problem were also given in the anthropological Section; one by Mr. George Iles entitled: "Why Progress is in Leaps;" and a note by Prof. J. C. Ewart on the transmission of acquired characters.

Considerable material of interest and value to the psychologist was presented in these and other papers. The arrangement of the program, however, though admirable in most ways, was not especially suited to the exigencies of the department. Through the dividing up of these papers among three different Sections some were found to conflict with each other; at best the auditor was compelled to watch his time closely, and literally *pursue* his subject from one building to another.—H. C. W.

SCIENTIFIC NEWS.

The Ninth Annual Meeting of the Association of Economic Entomologists was held at Detroit, Aug. 12-13, 1897.—The address of the retiring president, Prof. F. M. Webster, treated of "The Present and Future of Applied Economic Entomology in the United States," and contained, among other very interesting features, a tribute to the value of the systematist and a somewhat caustic criticism of the "species maker," helpful suggestions for the experiment station worker, and a very frank discussion of the unfortunate results which attend the attempts sometimes made to combine politics and science. Seven were elected to active membership and three foreign members were elected: The Association now consists of 93 active and 31 foreign members. Seventeen papers were presented during the sessions of the Association.

Resolutions were passed requesting the publication of the proceedings as bulletin of the Division of Entomology, U. S. Dept. of Agriculture and expressing familiarity with the efforts of the state of Massachusetts to exterminate the gypsy moth and commending the results already accomplished.

The election of officers resulted as follows: President, Herbert Osborn, Ames, Iowa; 1st Vice-President, Lawrence Bruner, Lincoln, Neb.; 2nd Vice-President, C. P. Gillette, Ft. Collins, Colo.; Secretary-Treasurer, C. L. Marlatt, Washington, D. C. The next meeting of the Association will be held at Boston, Mass., Aug. 19-20, 1898.

The Archæological Institute of America is about to commence the regular and uniform publication of its papers, reports, and other documents. For this purpose it has obtained control of the American Journal of Archæology, formerly edited by Professor Forthingham.